Fairview Microwave
an INFINITE brand

FMAM5101
DATA SHEET

35 dB min Gain, Temperature Compensated Low Noise Amplifier, 21 dBm P1dB Operating from 0.5 GHz to 4 GHz with SMA

The FMAM5101 is a temperature compensated RF amplifier that covers a broadband frequency from 0.5 GHz to 4 GHz. The GaAs FET design utilizes PIN diode compensation circuitry that adjusts gain levels as the device is exposed to temperature variations. At high temperatures, the gain level will be about 1 to 1.5 dB lower and at low temperatures the gain level will be about 1 to 1.5 dB higher. The gain level will always be higher than the minimum specified gain level of 35 dB over the full operational temperature range of -55°C to +85°C. Impressive typical performance for the 50 ohm design includes Noise Figure of 4.0 dB, P1dB of +21 dBm, and VSWR of 1.4:1 typ. DC Bias Voltage ranges from +12V to +15V with 350 mA DC current. The rugged and compact Mil Grade aluminum package supports SMA female spark plug connectors, and is designed to meet a series of Mil-STD-202 environmental test conditions including Altitude, Vibration, Humidity, and Shock.

Electrical Specifications

(TA = +25°C)

Description	Min	Typ	Max	Unit
Frequency Range	0.5		4	GHz
Small Signal Gain	35	47		dB
Gain Flatness			±1.75	dB
P1dB	+20	+21		dBm
Noise Figure		4	4.5	dB
Impedance (Input)		50		Ohms
Impedance (Output)		50		Ohms
Input VSWR		1.4:1	2:1	
Output VSWR		1.4:1	2.1:1	
Operating DC Voltage	+12		+15	Volts
Operating DC Current		350		mA
Operating Temperature Range	-55		+85	°C

Mechanical Specifications

Size	
Length	1.62 in [41.15 mm]
Width	0.8 in [20.32 mm]
Height	0.4 in [10.16 mm]
Weight	0.15 lbs [68.04 g]
Input Connector	SMA Female
Output Connector	SMA Female

Environmental Specifications

Temperature	
Operating Range	-55 to +85 deg C
Storage Range	-40 to +100 deg C
Humidity	MIL-STD-202F, Method 103B, Condition B
Shock	MIL-STD-202F, Method 213B, Condition B

Features:

- Temperature Compensated GaAs FET Amplifier Design
- Frequency Range 0.5 GHz to 4 GHz
- PIN Diode Compensation Circuitry
- Small Signal Gain 47 dB typ
- Operational Temperature Range -55°C to +85°C
- Noise Figure 4 dB typ
- Output P1dB +21 dBm typ
- VSWR 1.4:1 typ
- DC Voltage +12 to +15 Vdc
- DC Current 350 mA typ
- SMA Female Connectors
- Rugged Mil Grade Aluminum Package Design
- Designed to meet MIL-STD-202 environmental test conditions

Applications:

- Aerospace & Defense
- Test & Measurement
- Microwave Radio Systems
- Military & Commercial Communication Systems
- Research & Development
- RF Front Ends
- SATCOM
- Wireless Communications
- Unmanned Systems

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Vibration	MIL-STD-202F, Method 204D, Condition B
Altitude	MIL-STD-202F, Method 105C, Condition B

Compliance Certifications (see product page for current document)

Plotted and Other Data

Notes:

- Values at 25 °C, sea level
- ESD Sensitive Material, Transport material in Approved ESD bags. Handle only in approved ESD Workstation.//Heat Sink Required for Proper Operation, Unit is cooled by conduction to heat sink.//Excessive reflected power beyond a 3.5:1 VSWR match will damage the amplifier. For safe operation, it's highly recommended a high power isolator or attenuator be used at the output of the power amplifier.

Amplifier Power-up Precautions

1.) Confirm that proper ESD precautions and controls are always in place before handling any Amplifier module.

2.) Confirm adequate thermal management is in place to effectively dissipate heat away from the Amplifier package. The Amplifier operational baseplate temperature must be within the operational temperature range stated in the Amplifier datasheet. Depending on the design and thermal requirements, using a heatsink with cooling fan is always recommended for safe reliable operation. A heat sink without a cooling fan may also be used. Damage caused from overheating will void the warranty.

3.) Confirm adequate system grounding is established. The DC power supply and Amplifier must have a common ground in order to operate properly.

4.) Power Amplifiers may require additional DC Current when initially powered-up. Depending on the design, the input current draw could range from an additional 10% to 100% above the maximum rated DC current of the Amplifier. This varies based on product part number.

5.) Confirm the DC power supply, if limited, is set to allow for additional start-up current that's rated for the Power Amplifier.

6.) Confirm the system is designed and calibrated for 50 ohms. Any impedance mismatch may cause performance issues.

7.) Perform a CALIBRATION (if required) with the loads before connecting the Amplifier to the Network Analyzer to ensure proper performance.

8.) Use a fixed attenuator between the signal source and input port of the Amplifier to optimize the input VSWR match.

9.) Confirm the input power level at the input port of the amplifier does not exceed the maximum rated limit for input power (as stated in the Amplifier datasheet).
   P_{in} for Small Signal Gain = P1dB-SSG-10 dB
   P_{in} for P1dB = P1dB-SSG+1 dB

10.) Confirm the Network Analyzer is always connected to the Amplifier first before DC power is applied to the Amplifier.

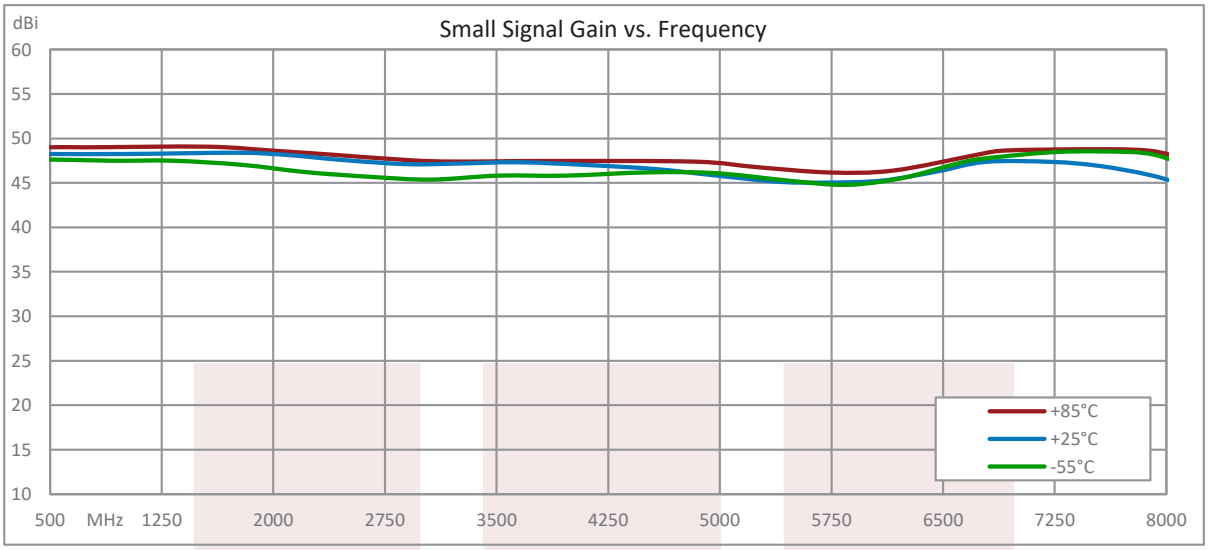
11.) As long as the input and output ports of the amplifier are connected to a 50Ohm load and RF signal power is applied, the Amplifier can be powered up with DC voltage.

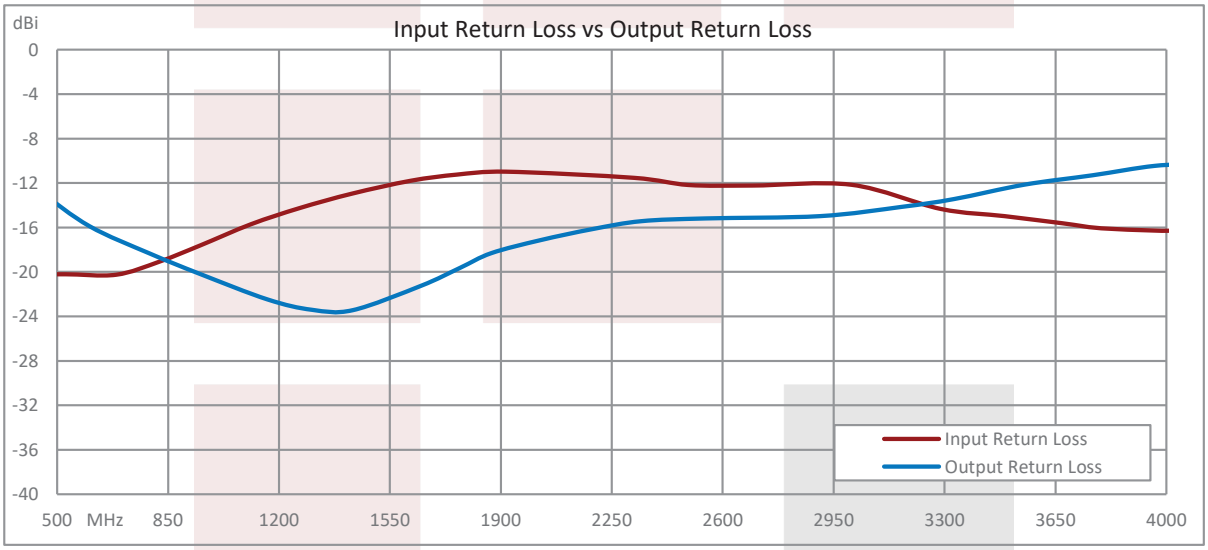
12.) Confirm the Amplifier output load is matched for a 50 Ohm impedance and will not exceed the maximum rated VSWR or Return Loss limit for the Amplifier. Exceeding the maximum rated VSWR or Return Loss limit will result in reflected signal power that could damage the Amplifier and void the warranty.

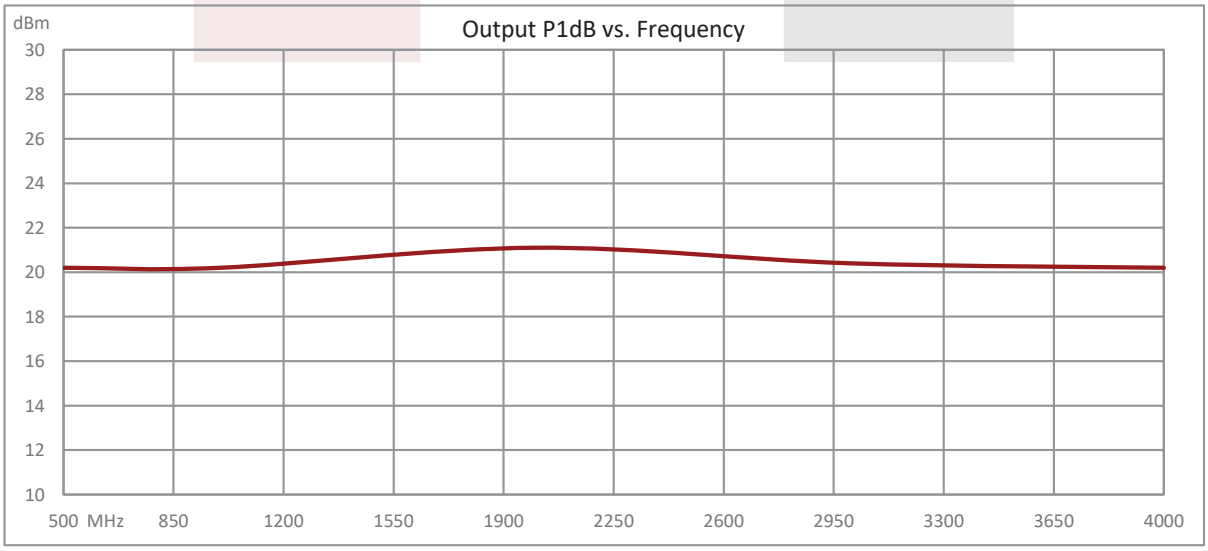
13.) **Power Amplifier connected to an Antenna for signal transmission** - It's strongly recommended to use a high power fixed attenuator pad or an Isolator between the output port of the Amplifier and input port to the antenna. Any reflected signal power due to impedance mismatch will likely damage the Amplifier and void the warranty.

14.) The attenuator or isolator used at the output port of the Amplifier must be rated to handle the output power level and operational frequency band of the amplifier.

Typical Performance Data







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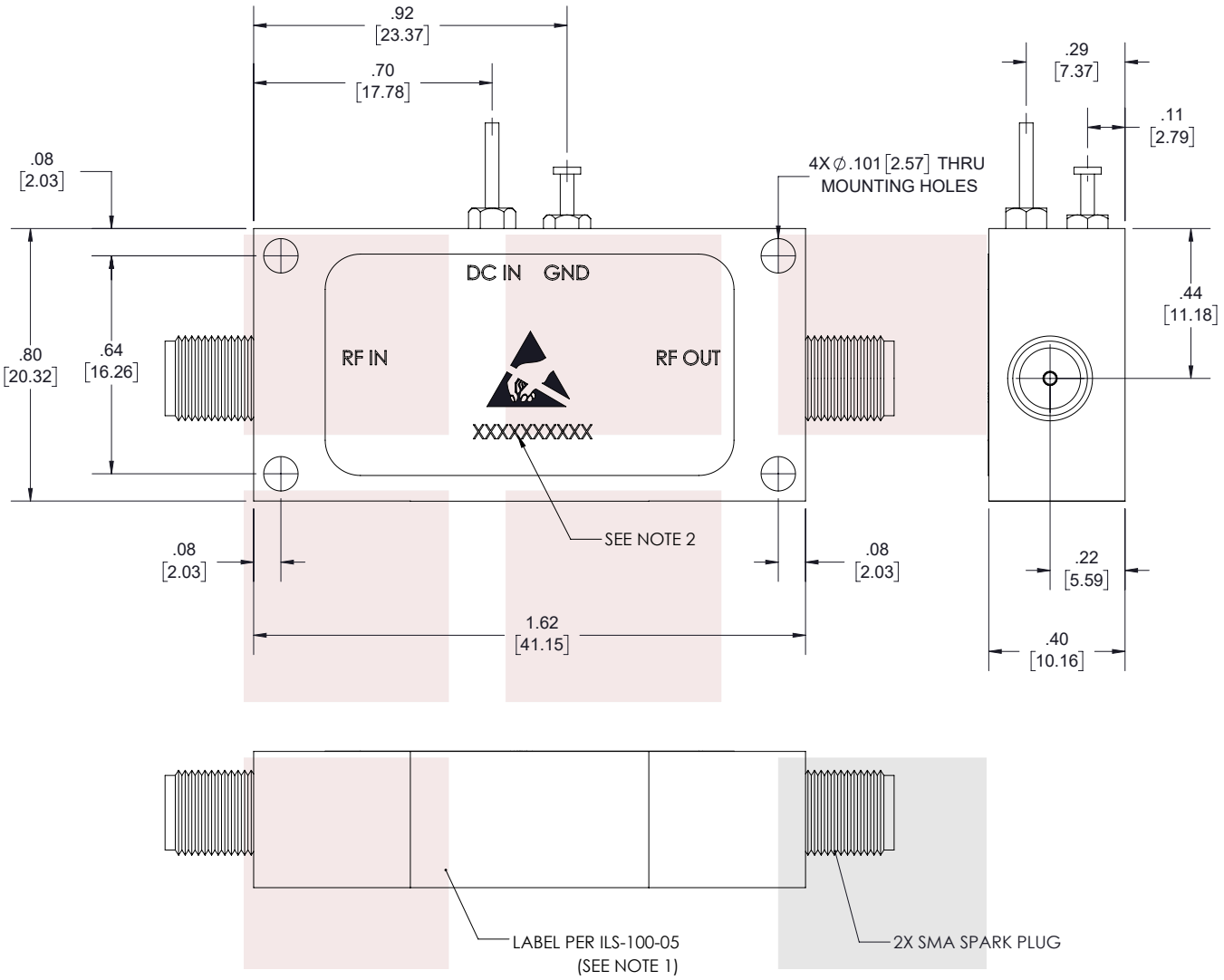
35 dB min Gain, Temperature Compensated Low Noise Amplifier, 21 dBm P1dB Operating from 0.5 GHz to 4 GHz with SMA from Fairview Microwave is in-stock and available to ship same-day. All of our RF/microwave products are available off-the-shelf from our ISO 9001:2008 certified facilities in Lewisville, Texas. Fairview Microwave is RF on-demand.

For additional information on this product, please click the following link: 35 dB min Gain, Temperature Compensated Low Noise Amplifier, 21 dBm P1dB Operating from 0.5 GHz to 4 GHz with SMA FMAM5101

URL: https://www.fairviewmicrowave.com/47db-medium-power-high-gain-amplifier-21dbm-fmam5101-p.aspx

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	05/20/2021	TGALLA



NOTES:

1. LABEL PER ILS-100-05. FOR INTERNAL REFERENCE ONLY.
   LABEL LOCATION SHOULD BE SAME AS SHOWN.
2. SERIAL NUMBER AND DATE CODE ARE COMBINED. EX: 202008280001.

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TITLE

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UNLESS OTHERWISE SPECIFIED LEADING DIMENSIONS ARE INCHES
DIMENSIONS IN [ ] ARE MILLIMETERS

TOLERANCES:

.X = ± .2 [5.08]
.XX = ± .02 [.51]
.XXX = ± .005 [.13]
FRACTIONS ± 1/32
ANGLES ± 1°

CABLE LENGTH (L) TOLERANCES:

L ≤ 12 [305] = +1 [25] / -0
12 [305] < L ≤ 60 [1524] = +2 [51] / -0
60 [1524] < L ≤ 120 [3048] = +4 [102] / -0
120 [3048] < L ≤ 300 [7620] = +6 [152] / -0
300 [7620] < L = +5%L / -0

ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

THIRD-ANGLE PROJECTION

SHEET	OF
1	1

SCALE: N/A

SIZE	CAGE CODE	DRAWN BY	ITEM NO.	REV
A	3FKR5	MVEERAPPAN	FMAM5101	A

T-Rev.D